FORESTIERA IN SOUTHERN AND SOUTHWESTERN TEXAS

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Material of *Forestiera* growing along the delta of the Rio Grande in Texas has long been accepted by botanists as *F. angustifolia* Torr., a species which, in Texas, occurs only much farther west,—particularly in the trans-Pecos area of the state. My tentative identification of this Rio Grande material as *F. porulosa* was questioned by Mr. Ernest J. Palmer who had referred it to *F. angustifolia.* During subsequent correspondence between us it was agreed that we were both wrong in our tentative identifications, and that the species was undescribed.

Forestiera texana sp. nov. Arbor 2.5–4 m. altus, glaber, cortice griseo, ramulis gracilibus, haud rigidis; foliis saepissime oppositis, fasciculatis, paribus raro vel 2-paribus, oblongis, elliptico-oblongis ad ellipticis, apicibus rotundatis, cuneatis vel basibus rotundatis, brevipetiolatis subsessilibusve, ad 5 cm. longis, 9 mm. latis, saepissime 2.5 cm. longis vel minoribus, 6 mm. latis vel arctioribus, auctumno multo longioribus latioribusque quam vere, lamina subtus porulosa manifeste 1-nervia, utrinque pallide viride; pedicellis plerumque 4–5 mm. longis; fructo oblongo, saepius recurvo, acutato, stylo gracili terminato, 1 mm. longo vel breviore; nucula oblonga pluricostulata, basi truncata, saepius curva, apice acutata, ad 8 mm. longa, 2.5 mm. crassa.

Small tree 2.5–4 m. high, glabrous, with grayish bark and slender not stiff, branchlets; leaves chiefly opposite, scarcely fasciculate, occurring in pairs or infrequently with the pairs doubled, oblong, elliptic-oblong to elliptic, rounded at the apices, cuneate to rounded at bases, short-petioled to subsessile, up to 5 cm. long and 9 mm. broad, but mostly 2.5 cm. long or less and 6 mm. or less broad, being both much longer and much broader late in the season than in early spring, the under surface porulose and conspicuously 1-nerved, both surfaces light green; pedicels mostly 4–5 mm. long; fruit oblong, usually curved, acute, tipped with a slender style which is 1 mm. long or somewhat more; nutlet oblong, many-ribbed, truncate at the base, usually curved, acute at the apex, up to 8 mm. long and 2.5 mm. broad.

Type. Nine miles south southeast of La Feria, Cameron County, Texas, April 4, 1938, *Cory 28393* (Arnold Arboretum, Harvard University; isotype, Tracy Herbarium of A. and M. College of Texas, College Station).

Other specimens seen. Texas: Brownsville, Cameron County, April 4, 1938, *Cory 28293;* southwest of Donna, Hidalgo County, November 13, 1940, *Cory 36273;* La Joya, Hidalgo County, August 24, 1943, Mrs. E. J. Walker (*Cory 43015*).

All of these specimens have been studied carefully and com-

pared with typical *F. angustifolia* collected at the San Felipe Country Club of Del Rio, Val Verde County, Texas, in May, 1943 (*Cory 41729*). The writer has seen *F. texana* growing only in Cameron and Hidalgo counties, both localities being rather remote from the range of *F. angustifolia.* Certain contrasting characters of these two species are given in the following table:

	F. texana	*F. angustifolia*
Habit	Moderately branched small tree	Densely branched bush or shrub
Bark	Grayish or pale	Dark to almost black
Branchlets	Elongate, slender, not stiff	Short, stout, stiff
Foliage	Pale green	Dark green
Leaves	Averaging about 20×4 mm., comparatively broad, not fasciculate	Averaging about 10×1.5 mm., comparatively narrow, fasciculate in clusters of 2 to 6.
Pedicels	4–5 mm. long	2 mm. long or less
Nutlets	Slender, acute, 6–8×2.5 mm.	Stout, rounded, 6×3 mm.

Among specimens borrowed from the Arnold Arboretum, Harvard University, all of which had been identified tentatively as *F. angustifolia,* were five which appeared closely related to *F. texana.* One of these specimens (collected January 25, 1934, in Zapata County, Texas, *Elzada U. Clover 1685*) in sparse foliage only, the leaves are almost linear, up to 4 cm. long and 3 mm. broad, and somewhat acute at the apices instead of being broadly rounded. This specimen appears to merit distinction as a variety or form under *F. texana,* but more ample material is needed before any decision can be reached. The other four specimens, it seems to the writer, represent an entity worthy of description at this time as a variety of *F. texana.* Because of the close association of Ernest J. Palmer in the collection and study of this material, I take pleasure in dedicating this variety in his honor.

Forestiera texana var. **Palmeri** var. nov. A forma typica differt foliis confertioribus, brevioribus, arctioribus, verticillatim dispositis; folio hujus varietatis typico 1.5 cm. longo, vix vel haud 3 mm. lato; fructu cum formae typicae congruit.

This variety differs from the species in its denser foliage and its shorter and narrower leaves averaging 15 mm. in length and less than 3 mm. in breadth and usually borne in clusters; fruit similar to that of the species.

Type. Val Verde County, Texas, June 29, 1917, *Palmer 12372* (Arnold Arboretum).

Other specimens seen. Texas. La Salle County, March 17, 1917, *Palmer 11307;* Uvalde County, June 20, 1917, *Palmer 12319a;* Live Oak County, July 11, 1935, *H. B. Parks* (*Cory 14885*).

The remaining specimens borrowed from the Herbarium of the Arnold Arboretum seem to be distinct from each other and from the species and varieties already described. Rather than to propose naming these as new, I prefer to give only collection data

and brief descriptions in the hope that subsequently either I or other collectors will have an opportunity to make adequate studies to determine their status.

1. Brewster County, Texas: shearing pens, Chisos Mountains, July 12, 1932, *C. H. Mueller.* This material lacks fruit, but there is some similarity in size and arrangement of leaves to *F. angustifolia,* from which this specimen differs in its grayish bark and foliage, in its greater density of foliage, and in its leaves all being cuneate at their bases, and in their upper surfaces being minutely hirtellous.

2. Maverick County, Texas: Eagle Pass, *V. Havard.* In all probability this specimen was collected prior to 1885. It has more nearly the foliage of *F. angustifolia* than of *F. texana.* I have seen it in the vicinity of Eagle Pass, but since the plants were regarded as being the former species they received no special attention. Plant a shrub; bark light to dark brown; leaves cuneate-oblong, obtuse, 10–18 mm. long, 1–2 mm. broad, more or less fasciculate, glabrous, subsessile; fruit oblong, about 6 mm. long and 4 mm. thick; nutlet relatively short and thick, about 5 mm. long and 3 mm. thick, rounded at base, blunt at apex, concavo-convex in one profile and at right angles thereto somewhat ovate.

3. Cameron County, Texas: Point Isabel (now Port Isabel), April 8, 1931, *Susan Delano McKelvey 1779.* This differs from all other material of this study in its small, subglobose fruit. Bark grayish; branchlets slender; foliage dense; leaves oblong-cuneate, 1–2 cm. long, 3–4.5 mm. broad, mostly in clusters of 2 to 4, glabrous, short-petiolate, porulose; fruit subglobose, about 4 mm. in diameter, borne on a pedicel 4–4.5 mm. long; nutlet plump, somewhat longer than broad, one face flattened, both ends broadly rounded, less than 4 mm. long and about 3 mm. thick.

4. Mexico: San Miguel, April 14, 1887, *C. S. Sargent.* It is likely that the locality is San Miguel el Grande in Central Mexico, 40 miles west of Guanajuato. The foliage in this species is similar to that of *F. angustifolia,* but its short, ovoid fruits differ from those in all of the other material in this study. Fruiting branches sparingly leafy; leaves 10–15 mm. long and 2–3 mm. broad, glabrous, spatulate, cuneate, porulose, usually borne in clusters of two or more; fruit ovoid, about 5 mm. long and 4 mm. thick, borne singly or in clusters of 2 to 4, on pedicels 3–4.5 mm. long; nutlet short and broad, ovoid, about 4 mm. long and 3 mm. thick.

With the exception of the specimens referred to *F. texana* var. *Palmeri,* all of the material from Texas seen in this study comes from along the Rio Grande. This complex of forms or species apparently stems from a center somewhere in Northern Mexico and its distributional and variational pattern affords opportunity for an interesting study.

I wish to express grateful appreciation to the following members of the Arnold Arboretum staff,—to Dr. A. C. Smith, Curator of the Herbarium, for the loan of specimens, to Mr. Ernest J. Palmer for reviewing my study, and to Dr. Leon Croizat for valuable assistance given me in the preparation of the Latin descriptions in this manuscript. I wish, also, to express gratitude to Mrs. E. J. Walker of La Joya, Hidalgo County, for the excellent material of *Forestiera texana* which she sent to me.

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REVIEWS

The Flowering Plants and Ferns of Mount Diablo, California. By Mary L. Bowerman. Pp. xi + 290, frontis. + 26 figs. Gillick Press, Berkeley, California, 1944. $3.75.

Miss Bowerman's intensive survey of the flora of the Mount Diablo region of central coastal California is divided into two sections: first, an introductory discussion dealing with physical factors, concepts and descriptions of plant communities, and floristic relations, and second, an annotated catalogue of the vascular plants.

The catalogue constitutes the main contribution of Miss Bowerman's book. The accounts of species contain data on habitat, altitudinal range, abundance, period of blooming, associates, and local distribution. Keys to families, genera, and species are included, as are also bibliography, glossary, and index. To an ecologist interested in plant-animal interrelations, this catalogue is the best kind of guide to a local flora and provides sound groundwork for evaluation of such interrelations. Those accounts dealing with dominant species, such as the oaks, are especially significant. The factual information appears clearly set forth and constitutes a valuable storehouse of data for plant geographers and systematists.

Attention is here directed to the section of Miss Bowerman's book dealing with ecological aspects of the vegetation, occupying pages 17 to 63, and consisting chiefly of descriptions of plant aggregations of several orders, listed as formations, associations, and societies, together with observations on succession in woodland, grassland, and chaparral. These descriptions and observations are relatively brief and entirely qualitative; they are thus of a preliminary character. Commendable reserve is shown in the treatment of this section, as, for instance, in the use of only the three community terms mentioned above without any attempt to distinguish successional from climax units. Further, the author points out that plant communities of the Coast Ranges are unusu-